

Applicant : Yves Faisandier  
Appl. No. : 10/724,520  
Examiner : Vikram P. Sundararaman  
Docket No. : 8707-2170

## REMARKS/ARGUMENTS

Claims 1-20 are pending in this application and under consideration.

### I. Rejections under 35 USC §102 based on Xu

Claims 1-3, 8 and 14 are rejected under 35 USC §102(b), as being anticipated by *Xu et al. U.S. Patent No. 6,368,283 B1 ("Xu")*. Applicant respectfully traverses the ground for this rejection.

The Examiner correctly notes that Xu refers to acquiring an electronic phonocardiographic ("PCG") signal corresponding to detected acoustic signals of a patient, using a sensor on the patient's thoracic wall (Action at 2). However, we respectfully submit that Xu does not teach or suggest a "means for analyzing at least one predetermined parameter of the vibratory profile and, in response, delivering according to said one parameter, a phono-arterial index value representative of the patient's blood pressure," as called for in applicant's claim 1, and claims 2-20 depending therefrom. Rather, Xu teaches a technique for estimating systolic and mean pulmonary pressures of a patient through an analysis of the PCG signal that involves linear regressive formulas, but which does not teach or suggest that which applicant is the first to discover and claim, specifically, determining a phono-arterial index that is useful as a diagnostic tool separate from determining an actual blood pressure measurement.

In this regard, applicant's invention, as defined by claim 1 of the pending application, is directed to, among other things, an analyzing means, able to analyze at least one predetermined parameter of the vibratory profile and to deliver in response, according to the at least one parameter, a phono-arterial index value representative of

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the blood pressure. As described in applicant's specification at page 8, the "phono-arterial index" is a "value ... giving a relative indication of the value of the blood pressure." This index can be determined based on any of a number of measurable parameters of the second cardiac noise, including but not limited to the extrema -- the "difference [] measured between the maximum and minimum values of the signal amplitude during the relevant noise time period " (specification at 7) -- or "the energy of the signal, the variation of the derivative of the signal (in particular, the maximum value of this derivative), the surface of the signal or of the principal peak of this signal, or indeed, of a combination of some or all of the foregoing parameters." (*Id.* at 8). Significantly, the phono-arterial index is a measure that can be recorded "over a relatively long duration [that] will make it possible for a physician to perform a diagnosis, to recognize the existence of a pathology, to determine the occurrence and the importance of one or more episodes of hypotension or hypertension, etc." (*Id.*).

But the phono-arterial index is not a measurement of blood pressure. Indeed, in accordance with applicant's disclosure, it is noted that the present invention can be coupled with "another device that carries out an absolute measure of blood pressure" that can be used to supplement the indications that will be given to the physician for a diagnosis. (*Id.*).

The Xu patent relied on by the Examiner does not teach or suggest any apparatus or method to obtain the "phono-arterial index" that is called for in applicant's claim 1, and the claims depending therefrom. Rather, Xu teaches a technique for acquiring an absolute measurement of blood pressure based on the PCG signal using

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predetermined regressive functions<sup>1</sup>. We respectfully submit that applicant is the first to have discovered and claimed the subject matter defined by claim 1, and claims 2-20 depending therefrom. Accordingly, because Xu does not disclose each and every limitation<sup>2</sup> of applicant's claim 1, we respectfully submit that the Examiner's anticipation rejection of claim 1 based on Xu should be withdrawn. For at least the same reasons that claim 1 is allowable, the Examiner's anticipation rejection of claims 2, 3, 8 and 14 should be withdrawn, and, further, claims 2-20 which depend from claim 1 are also allowable.

II. The Rejections Based on Xu and Mohler Should be Withdrawn

Claims 6 and 17 are rejected under § 103 based on Xu in view of Mohler U.S. Patent 6,050,950 ("Mohler"). We respectfully traverse.

To establish a *prima facie* case of obviousness, there must be: (1) some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine references teachings; (2) a reasonable expectation of success; and (3) prior art references which teach or suggest all of the claim limitations. See *In re Kotzab*, 217

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<sup>1</sup> It is unclear whether the Examiner's reference to the "splitting interval" disclosed in Xu (See Action at 3) was intended to suggest that the term corresponds to the "phono-arterial index" called for in applicant's claim 1. We respectfully submit that it does not. The splitting interval is a well known term that is the interval between the onset of the aortic and pulmonary components and is related (indirectly proportional) to the heart rate and used by Xu to measure blood pressure. See Xu at Col. 2, lines 56-66. This term of art has nothing to do with applicant's novel determination of a phono-arterial index representative of the patient's blood pressure.

<sup>2</sup> "[A] claim is anticipated if each and every limitation is found either expressly or inherently in a single prior art reference." *Celeritas Techs., Ltd. v. Rockwell Int'l. Corp.*, 150 F.3d 1354, 1361, 47 U.S.P.Q.2d 1516, 1522 (Fed. Cir. 1998). The standard for lack of novelty, that is,

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F.3d 1365, 1370 (Fed. Cir. 2000); MPEP § 2143 (8th Ed., Rev. 1). Further, to render a claim obvious "the reasons why one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious" must be identified specifically. *In re Rouffet*, 149 F.3d 1350, 1359, 47 U.S.P.Q.2d 1453, 1459 (Fed. Cir. 1998).

Claim 6 calls for:

6 The device of claim 2, wherein said at least one sensor further comprises at least a first sensor and a second sensor, and means for combining the phonocardiographic signals delivered by said at least first and second sensors into a combined signal, wherein said phonocardiographic signal of said discriminating mean comprises said combined signal.

Claim 17 is similar, differing in depending directly from claim 1, rather than claim 2.

As the Examiner concedes, the primary reference Xu does not teach or suggest the use of a first and a second sensor, each of which detects a PCG signal, or means for combining the PCG signals detected by the at least first and second sensors, as required by claims 6 and 17. We respectfully submit that the Examiner's obviousness rejections cannot be sustained because, regardless of whether there is a proper motivation to combine, and we submit there is none, the secondary reference Mohler also does not teach or suggest a device "wherein said at least one sensor [placed on a

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for "anticipation," is one of strict identity. *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d

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thoracic wall of a patient [and] responsive to acoustic signals generated by the closing of the patient's cardiac valves] further comprises at least a first sensor and a second sensor," each of which is placed on the thoracic wall and is responsive to the patient's cardiac valves, and does not teach or suggest "means for combining the phonocardiographic signals delivered by said at least first and second sensors into a combined signal" as called for in applicant's claims 6 and 17. We respectfully submit that the Examiner has taken the language of the further limitation of claims 6 and 17 regarding "first and second sensors" out of context, disregarding the limitation that both those first and second sensors inherit the common limitations of the "said sensor" of claim 1 from which they depend, such that each sensor produces a respective PCG signal that are combined in the combining means.

The secondary reference Mohler does not teach or suggest two separate sensors coupled to the patient's thoracic wall to detect respective PCG signals that are then combined. Rather, Mohler actually teaches away in teaching to have one sensor on the thoracic wall to detect the PCG signal, and a second sensor exposed to the environment to detect ambient noise, which disparate signals are then combined. This combination is so that a common mode rejection signal can be used to improve the PCG signal obtained by the one sensor. In other words, this embodiment disclosed in Mohler does not in any way teach or suggest "means for combining the phonocardiographic signals delivered by said at least first and second sensors into a combined signal" as required by applicant's claims 6 and 17 because only one PCG

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signal is used.

To the extent that the Examiner refers to Mohler's brief disclosure of "a plurality of sensor assemblies [to] simultaneously obtain signals from various locations of the body" (Mohler, Col. 7 at lines 9-13), we respectfully submit that this also does not teach or suggest what is called for in applicant's claims 6 and 17 because there is no teaching or suggestion of any functionality to acquire or to combine – let alone how or why one would combine -- such multiple PCG signals into a combined PCG signal. To the contrary, this alternate embodiment of Mohler teaches that separately acquired signals are passed to "individual data acquisition modules which contain means for signal filtering, impedance matching, amplification and buffering." (Mohler, Col 13, at lines 35-44). The only signals Molher suggests to combine are the one PCG and the one environmental signal – but not to combine multiple PCG signals. We respectfully submit that this is what applicant is the first to have discovered and claimed as recited in claims 6 and 17.

In point of fact, Mohler does not teach or suggest to a person of ordinary skill in the art to employ first and second sensors to obtain respective PCG signals that are then combined for use in generating an phono-arterial index. Mohler simply operates in a fundamentally different manner from, and neither cures the deficiencies of Xu nor teaches or suggests applicant's subject matter as recited in claims 6 and 17. For the foregoing reasons, we respectfully submit that the Examiner's rejections of claims 6 and 17 based on Xu in view of Mohler should be withdrawn, and claims 6 and 17 are allowable for this independent reason.

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**III Allowability of Claims 7, 10-13, and 18**

We note with appreciation the Examiner's indication that claims 7, 10-13 and 18 contain allowable subject matter. In view of the foregoing reasons why the pending claims are believed to be allowable over the art relied on by the Examiner, applicant respectfully reserves his right to amend claims 7, 10-13 and 18 to place them in independent form including all of the limitations of the base claim and any intervening claim, if appropriate, in response to the next Action. Indeed, we respectfully submit that it would be premature to submit additional claims indicated to be allowable in independent form, given the additional fees that would be incurred to do so, when all claims are now believed to be in allowable form.

**IV. Conclusion**

Applicant respectfully submits that he has made a patentable contribution to the art. Prompt and favorable action on the merits of the claims is earnestly solicited. Should the Examiner have any questions or comments, the undersigned can be reached at (212) 506-5280.

The Commissioner is authorized to charge any fee which may be required in connection with this Amendment to deposit account No. 15-0665.

Respectfully submitted,  
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